

# COMPUTER WORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper—Second-class postage paid at Boston, Mass

Vol. III No. 16

April 23, 1969

Price: \$9/year



The TC700 electronic teller terminal is the newest member of Burroughs' terminal-computer family.

## Burroughs Again Expands Terminal-Computer Family

DETROIT — A new teller terminal computer, based on the TC700 terminal, has been announced by Burroughs Corp. to serve the banking industry and other industries where multi-function terminals are needed in a window-oriented or counter-oriented business.

The unit can operate either as a remote terminal with Burroughs computers or with those of any other manufacturer who meets industry specifications, and is ideally suited to the real-time processing environment.

Macdonald, Burroughs president, said

Savings Banks and the National Society of Controllers and Financial Officers of Savings Institutions, Macdonald said. He added that he believed this was "the first teller console to meet industry specifications."

The unit uses the standard communication procedures proposed by the USA Standards Institute and the International Standards Organization and adopted by the European Computer Manufacturers Association. The unit will operate with all computers which meet these specifications, Macdonald said.

### Programming

Programming for the device is handled through "firmware," a sequence of instructions, alterable by Burroughs or the user, which calls up the microprograms used to perform the unit's functions. Burroughs will supply software programming or customer training on a fee basis, a policy established for both the TC500 and the L2000.

The system consists of five major modules: operator keyboard, memory unit, disk, logic circuitry, I/O control, and high-speed printer.

Prices for the system range from \$8,840 to \$13,400, and deliveries will start in January 1970. The initial demonstration of the system will take place at the Miami convention of the Savings & Loan Controllers, May 19-21.

## Plug-to-Plug Compatibility Wins Defense Department's Support

WASHINGTON, D.C. — The Defense Department is taking immediate action to acquire peripherals competitively whenever technically feasible.

Robert G. Mool, assistant secretary of defense, has told the Army, the Navy, the Air Force, and other defense groups to implement the policy immediately for magnetic tape stations and other cases where plug-to-plug compatibility can be readily established. He also told them that outside vendors of plug-to-plug compatibles should be given equal consideration with the vendors

of the central processing units in all cases where peripherals are being added or replaced.

A Defense Department spokesman told CW that the main area of plug-to-plug compatibility currently being considered involved magnetic tape drives and disk drives. Other areas would include page readers and optical readers which were not necessarily direct replacement vendor systems, he said.

The Defense Department intends to watch carefully the problems that arise, particularly with regard to the responsibility

for maintenance of the multi-vendor systems, he said.

The introduction of competition into this area follows an argument pressed by the independent hardware companies for a year.

### Qualification List

The Defense Department called on the General Services Administration to prepare a list of peripherals which would show for each one the central processing units with which it can be connected. The suggested list would

(Continued on Page 5)

## GE Announces 2 High-Stack, Multiple-Spindle Disk Drives

PHOENIX — GE has announced two new mass-memory devices aimed at users of large-scale systems, including time-sharing and other applications requiring greater quantities of storage than GE previously offered.

The DSS-170 is competition for IBM's nine-drive 2314s. It is also a nine-drive unit with 11-disk high stacks.

It has an average access time of

75 msec, GE said, and transfers at the rate of 416,000 characters per second. Its capacity is 2,000,000 characters. GE has priced it to lease at \$5,675 per month, the same as the larger of the 2314s.

DSS-167 is a five-drive device with a capacity of 900,000 characters, expandable to 120,000,000. Access time of the DSS-167 is also 75 msec, but transfer rate is halved, to

208,000 characters per second. The 90,000,000-character storage device will lease for \$3,185 per month, with the expansion costing an extra \$675 per month.

The company expects that the new devices will extend application of its Integrated Data Store (I-DSS) data management system.

Deliveries of the new units are expected to begin in 15 months.



GE's new DSS-167 disk storage subsystem uses high-stack disk packs.

## IBM's 1130 and 1800 Markets Attacked By Compatible Computer, 60% Price Cut

ORANGE, Calif. — A computer aimed at the industrial automation market and said to be fully compatible with both the IBM 1800 and the 1130 has been developed by General Automation, Inc.

The GA 18/30 has a 16-bit word length, with memory available in increments of 4K to 32K. Direct addressing to the full 32K of 960-msec core is provided.

The company claims that the machine will process over 400,000 instructions per second.

The instruction repertoire is said to be fully compatible with both the 1800 and the 1130, plus a class of register-to-register commands. Sixteen general-purpose registers are provided.

The GA 18/30 is designed to supervise industrial computation. Standard peripherals include tape, disks, cards, printers, and teletypewriters. The I/O system is said to include 16 automatic program interrupt levels, programmable interrupts, and direct-to-memory I/O chan-

nels. Software includes assemblers, compilers, real-time monitors, and control programs, a company spokesman said.

The basic system price, with paper tape and keyboard, will be "less than \$20,000," he said, adding that the price of an 18/30 system is "less than 40% of the equivalent IBM 1800."

Deliveries are scheduled to begin this summer.

General Automation has offices at 706 W. Katella St. here.

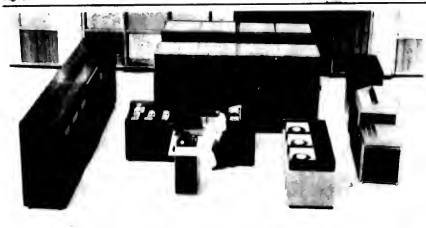
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Downtime Jumps 3000% After System Is Audited

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The GE-615, GE's new medium-scale computer system.

## GE's Newest Entry Is a Slower Less-Expensive GE-635 System

PHOENIX — The GE-615 is the latest entry in the medium-scale computer market.

In competition with the IBM 360/50, Univac 1106, and Burroughs 3500, among others, the new processor is essentially a somewhat slowed-down, less-expensive version of the GE-635.

The system is designed for three concurrent modes of operation: multiprogrammed local batch processing, remote batch operation from different-speed terminals, and reactive time-sharing, GE said.

The user of the 635 will be able to use the full line of peripheral equipment available to the larger 600 series processors, a GE spokesman said. The system is controlled by the General Comprehensive Operating System (Gecos) using batch-oriented compilers such as Fortran IV and Texteditor; time-sharing languages including Basic, Fortran, and Cobol; and application software, such as Apt III, Linear Programming, and parts explosion, he said.

The processor cycles one 36-bit word in 2 microseconds and is

said to add 244,000 numbers per second. It is available in sizes of 65K to 256K words.

A system with 65K of main memory, 30 million characters of disk storage, card reader and punch, eight magnetic tapes, 1200-line-per-minute printer, and console typewriter will rent for slightly under \$30,000 per month, he said.

Two communications processors can be used — the Datnet-30 and the new GE-355.

The company expects to start delivering the 615 in June

## Computers-in-Law Institute Set on Software Protection

WASHINGTON, D.C. — A Software Protection Workshop sponsored by the Patent Resources Group, under the direction of the George Washington University Computers-in-Law Institute, will be held here at the Hotel America June 2-4.

The program will consist of a discussion of various ways in which software can be protected through patents, trade-secret agreements, and government and private contract arrangements. The course will be under the direction of Howard R. Popper of Bell Laboratories in conjunction with Professor Irving Kayton. Its primary objective will be toward lawyers serving computer users and software and

hardware manufacturers. For those who feel a need, a hardware/software technology tutorial will be held during the first morning of the session.

Kayton said that, properly prepared, software patent applications could lighten the burden of the Patent Office and that trade-secret agreements can be worded to remove ambiguities and reveal the true mutual intent

of the parties involved. A discussion of the possible changes in the patent laws and related rulings will be a major part of the second day's discussion. The Nasa data clauses pertinent to software will be one of the topics Wednesday, the final day.

Further information may be obtained from the Patent Resources Group, 2011 I St., Washington, D.C. 20006.

## Off-Line Magnetic Tape Serves As Input to Microfilm Recorder

NEWTON UPPER FALLS, Mass. — A microfilm recorder designed to take input from an off-line magnetic tape has been announced by Beta Instrument Corp.



The Beta Com 600.

The Beta Com 600 is built around a Digital Equipment Corp. PDP/8 computer available in either 4K or 8K sizes. The basic system consists of the computer, a tape drive, and a precision CRT film recorder.

The company claims equal capability in forms and graphics reproduction.

Standard features include the ability to accept most print tape formats without reformatting, a 128-character set with upper and lower case letters and proportional spacing, programmable tabbing and skipping, and graphics, a Beta spokesman said.

The price will be about \$125,000, with an optional rental plan, he said. Production deliveries are scheduled to begin Nov. 1.

The company has offices at 377 Elliot St. here.

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# System Was Running Fine Then Came the Audit and Downtime Jumped 3000%

By Peter L. Briggs

**CW Staff Writer**  
WALTHAM, Mass. — A strange tale of the problems which a computer manufacturer's policy can create for a user came to light this month. The procedure of "system audit," used by certain manufacturers to "bring the equipment up to factory specifications," has made operations very difficult for one time-sharing service here.

## System Audit and Support

The user asked *Computerworld* to examine his records of downtime and correlate this information with the timing of the

"audit." The figures show (see chart) that after the audit was performed, system downtime for various reasons increased during normal working hours about 3000% (30 to 1) over the average for the previous three months.

An additional problem, and one faced by most non-IBM users, is the lack of manpower for hardware support. For several months the user had been complaining of the down time with which the manufacturer responded to service calls and the lack of availability of spare parts.

According to the user, at least

Many manufacturers perform a periodic overhaul of each customer's machine to bring the machine up to "factory specifications." This periodic, usually annual, functional checkout is called system audit, and the customer is frequently not informed when it is being done. One common result of such audits is a sudden rash of equipment failures from a machine which has been functioning well for some time.

some good things have come out of this series of problems since the audit. The manufacturer has agreed to speed up response time for calls, and, in fact, the service has been almost immediate since then. The manufacturer has had at least one qualified expert on the user's premises within two hours of the call.

## Real-Time Maintenance

The manufacturer admitted, according to the user, that it had not really learned to cope with the implications of a real-time system and its requirements. It was felt that a new schedule for

maintenance and support would have to be developed but that this would require some time. In the interim, the user told *Computerworld*, "Communications have been enormously improved since the audit. We now get response which is significantly better than the two to four hours we had to wait for someone of any qualification level to arrive." He felt that this, at least in part, made up for the disastrous results of the audit.

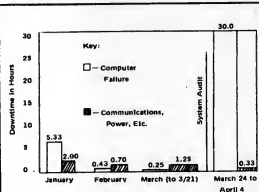
The user also pointed out that the causes for normal downtime, such as miscellaneous equipment failures related to telephones, electrical power, weather, and

human malfunctions, were almost as serious as the hardware failures.

Four and a quarter hours of downtime was experienced over the preceding three months for this type of problem. The user feels that utilities like the telephone company and power companies must learn to respond more quickly to this type of real-time emergency. These hours of lost time can seriously hinder the operation of many customers using the system for on-line processing, he said.

## "Audit" Approach Hurts

The user pointed out that there is a serious question involving the validity of the "audit" approach to system maintenance. He feels that, "Any piece of equipment as complicated and sensitive as a computer should not be tinkered with, even by skilled people, unless it is absolutely necessary."



## An Independent Disk Drive Manufacturer Wins Slot on Federal Supply Price List

NEW YORK — The General Services Administration has awarded a contract to MAI Equipment Corp. which enables the company to enter the Federal Supply Price List as an authorized disk supplier, the company said recently.

### Drives Cheaper Than IBM's

The drives being offered, the MAI 2301 disk, are produced for MAI by Peripheral Systems Corp., a Memorex subsidiary, and are basically similar to the Memorex 630 drives. The drives are being offered for \$475 a month, significantly less than the \$590 a month price of the equivalent IBM equipment. The 630 drives normally rent for \$500 per month for commercial customers.

The drives are completely compatible with the IBM 2311 for

most models of the IBM 360, the company told *Computerworld*, and have an average access time of only 0.9 milliseconds, as compared with 75 milliseconds for the IBM unit.

MAI also was recently awarded

a contract for punched-card equipment from the GSA, the largest order in MAI's history, the company said. The \$3.6 million contract is for the lease, sale, and servicing of punched-card equipment.

## Input Conference Planned To Aid Developing Nation

NEW YORK — A conference, "Improving Computer Input," will be held in Montego Bay, Jamaica, April 28 to May 2. Sponsored jointly by Adelphi University, Garden City, N.Y., and the Jamaica Industrial Development Corp., the conference will focus upon personnel problems in the computing field, and the role of computer science in a

developing nation.

Topics to be discussed include "Clerical Personnel — Selection and Training," "Professional Personnel — Organization and Management," "The Personnel Problems of Computer Network Administration," "Data Processing and Corporate Decision-Making," and "Organization and Administration of Computer Facilities."

**COMPUTERWORLD**  
THE WEEKLY FOR THE COMPUTER COMMUNITY

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Alan Taylor, Editor; Robert M. Patterson, News Editor; Evelyn Cowell, Special Supplement Editor; Neal White, National Sales Manager; Margaret Platten, Circulation Manager; Harry Fine, Art Services Supervisor; Kala Rachstein, Typesetting Services Supervisor.

Patrick J. McGovern, Publisher; W. Walter Boyd, Associate Publisher.

Subscription rates are \$9 for one year, \$16 for two years. Add \$1 per year for Canada; \$2.50 per year for Foreign. Please send all editorial and subscription material to: COMPUTERWORLD, 60 Austin St., Newton, Mass. 02160. (617) 332-9606.

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## Mouse and Joystick

The mouse, left, and the joystick, both devices for controlling the cursor on Ards and similar CRT displays, provide alternate ways of communicating with computers. Moving the mouse around on a flat surface causes the cursor to follow the motions. The buttons allow the user to input cursor position or its vector value. The joystick provides the same control plus buttons for selecting solid line input and dotted line input and for returning cursor control to the mouse. Both are products of Computer Displays Inc., Waltham, Mass.

## Plug Compatibility Wins Defense Agency Support

(Continued from Page 1)  
be qualified but would allow for certification that a peripheral does, in fact, work successfully.

### Liquidated Damages

The department also asked the GSA to add independent component companies to the federal supply schedule and to develop a series of standard "liquidated damages" clauses to handle problems of rendering credit for system downtime, etc.

## EMR Computer Cuts 6130 Price By Average 16%

MINNEAPOLIS, Minn. — EMR Computer has announced a price reduction for both purchased and leased systems in its Advantage 6130 series.

As a result of economics, a spokesman said, the outright purchase price of 6130 systems has been lowered by an average of 16%. Monthly lease rates have been reduced by approximately 30%, depending on system configuration, he said.

The purchase price of an 8K 6130 processor is now \$39,500, including memory parity and memory protection, high-speed arithmetic instructions, and three hardware index registers, he said.

Such a contract for independent peripherals has recently been issued to MAI for the installation of one of its 2301 disk drives in a government agency (see story on page 4).

### User Takes Responsibility

One of the main problems involved in using independent units is maintenance responsibility. Moot made it clear that the user should accept responsibility for the total operation of the system. In previous contracts the vendor was responsible.

### Immediate Action

He also specifically asked the defense agencies to implement the policy immediately, without waiting for the GSA to prepare the qualification list and the changes to the contracts.

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## On- or Off-Line Printing Handled Electrostatically

CLEVELAND — An electrostatic printer has been developed for computer terminal use by Clevis Corp.

The Model 4800 can handle alphanumerics and graphics simultaneously at rates up to 4,800 alphanumeric lines per minute, a company spokesman said.

The printer will accept, as input, serial or parallel digital data from computers, magnetic tape, card readers, raster-type CRT display memories, disks and drums, and communications lines, producing chart and graph output, as well as the conventional alphanumeric printouts, he said.

Writing is done by 600 char-

ing syll, any or all of which may be addressed in less than 1 msec and caused to write, he said. Graphics on a standard 8-1/2 by 11 in. page is in the form of 500,000 dot locations.

Typical applications will include transcription of CRT information onto hard copy, the spokesman said, and as replacements for line printers and Teletypes.

The 4800 is tentatively priced at \$15,000. OEM-sized lots are initially anticipated, and the company expects to provide interfaces, he said.

The company expects to be able to deliver from production in the fourth quarter, he said.

Clevis has offices at 37th and Perkins Streets here.



Clevis 4800 high-speed electrostatic printer

## Parking Lot to Be Computerized

NEW YORK — The Port of New York Authority will install a computer in the LaGuardia Airport parking lots later this year.

The system, which will include a centrally located Control Data 1700 computer and nine remote terminals at the parking lot exits, will automatically calculate and display the parking fee to the patron and eliminate the

present time-consuming manual calculation by the attendant.

The new system also will automatically gather statistical and accounting data.

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# New Datatnet System Has Better I/O Volume, Speed

PHOENIX — A new data communications system, the Datatnet-355, has been designed to provide improved input/output volume and speed.

The new unit is described as having a 1-μsec main memory, in sizes of 16K or 32K 18-bit words, all individually addressable. Different word lengths can be mixed and fully packed in storage.

The unit's I/O multiplexor is interrupt-driven to provide demand processing and is designed to handle up to 16 adapters, with an aggregate data rate of

bits/sec range, while the high-speed adapter has a range of 75-50,000 bits/sec.

Datatnet-355 operates under the General Electric Comprehensive Operating System (Geos) for I/O control. This is said to provide an interface which eliminates the need for special system programming.

The unit leases for \$4,000 per month, with the price going up as the configuration grows. It is scheduled for mid-1970 shipment.

General Electric Co., Phoenix, Arizona.

## 2-Million-Bit Disk

A 2-million-bit, head-per-track disk drive has been designed for core expansion on small computers, for use as buffer memory, and for extension of the capabilities of accounting machines and calculators.

The Model 7064 disk drive has an access time of 16.5 msec. It records at a density of 1,000 bits/in.

Cost per bit is said to be under 3 cents.

Information Storage, Inc., 8260 E. Eight Mile Road, Detroit, Mich. 48234.

## CRT Display Capability

A CRT display capability



500,000 accesses per second, according to the company.

A low-speed adapter can support line speeds in the 110-300

## New Products

has been added to System Associates' 2113 data acquisition and control system which is offered for use on the IBM 1130.

The system is said to be suitable for use in fields such as heavy manufacturing, chemicals, utilities, pipelines, and plastics.

The SVS-2113-10 CRT displays data on a 10-in. screen more quickly than it can be done on an on-line plotter.

SVS Associates, Inc., 2460 Lemoine Ave., Fort Lee, N.J. 07024.

## Typewriter Plotter

A typewriter plotting system has been developed for use with Fortran on the IBM 1130.

The system consists of a software package plus a Selectric typewriter containing 38 special characters in addition to the standard Fortran set. Plotting precision of about one thirtieth of an inch, both vertical and horizontal, is claimed.

The software can determine scales and coordinates automatically, or the programmer can determine output format

himself, according to the company.

The system is available now, and the company is preparing a 360 version, a spokesman said. TPL-OT Corp., 55 Mitchell Blvd., San Rafael, Calif. 94903.

## High-Speed Buffer

Users of the Varian 620/i computer are offered the company's new 620/i-21 high-speed buffer system that is said nearly to triple the computer's I/O capabilities.

The new unit consists of one or more 1-μsec memory banks, plus a control unit that allows direct access either by the computer or by high-speed peripheral devices.

The buffer system is designed to allow the 620/i to transfer at up to 770,000 Hz, without cycle-stealing or program interrupt.

Applications will include process control, displays, data acquisition, or any use that involves high speed and volume data transfer.

The buffer can have memory from 4K to 16K 16- or 18-bit words, in combination with dedicated computer memory, a 620/i can use up to 20K total system memory.

Varian Data Machine, 2722 Michelson Drive, Irvine, Calif. 92664.

## Digital Data Acquisition

A new system for analog and digital data acquisition and control has been developed for a number of scientific purposes.

Named Adac, the 2016 series acquires low- and/or high-level analog signals, and is said to enable the input of on-line functions, such as editing and producing digitized computer-compatible output.

The basic system consists of an analog input section, and inter-computer, a small general-purpose computer, and an ASR-33 typewriter. It costs under \$30,000.

Astrodata, Inc., P.O. Box 3003, 240 E. Palais Rd., Anaheim, Calif. 92803.

## Modified Teletype

A portable modified Model 33 Teletype and acoustic terminal has been announced that can be easily rolled up and down stairs.

Options include paper tape I/O, with or without automatic control, and separate or built-in acoustic data set with originate or originate/answer mode, maintains the company.

Price is \$1,475 (\$52 per month) singly, or \$1,095 (\$38) in quantity.



ComData, Inc., 7544 W. Oakton St., Niles, Ill. 60648.

## Low-Cost Modem

A small, low-cost modem, the TT-103 data set, is described as a low-speed modem that transmits and receives at 300 bits/sec.

The company says that it is possible to package the modem in a single card measuring about 4 1/2 in. by 10 in.

The unit is said to provide full-duplex data transmission over a two-wire circuit, and is compatible with the Bell 103, according to the company.

Cost is \$200 in small-quantity lots, scaled down for large quantities.

Tel-Tech Corp., 9170 Brookville Road, Silver Spring, Md. 20910.

## Miniaturized Calculator

A miniaturized calculator has been announced by the American subsidiary of Hayakawa Electric Co., Ltd. The unit is designed for American use. It



measures 4-5/8 in. by 9-1/2 in. and weighs 3-1/8 lb., according to the company.

While silent, it can add, subtract, multiply, divide, and perform mixed calculations. It also features a true credit balance, the company claims.

Sharp Electronics Corp., Carlstadt, N.J.

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Issue date — May 14th (mailed May 7th)

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## SJCC SHOW ISSUE

Issue date — May 21st (mailed May 14th)

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Pub. set closing — May 2nd\*

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## 'Systems 69' Congress Is Set for Munich This Fall

JERSEY CITY, N.J. — American companies involved in instrumentation, data processing, and systems management may introduce their latest technical developments to the European market when the Systems 69 scientific congress takes place Nov. 10-15 in Munich, Germany.

The week-long series of symposia and international exhibition is concerned with new technological developments and future problems in systems management, information systems, space research, marine technology, raw materials and energy sources, and traffic and city planning.

According to Gerald G. Kallman Associates, U.S. representa-

tives for the Munich Fair Authority, the Federal German Ministry for Scientific Research is cooperating with the Association for Future Problems in organizing the symposia. Experts from the United States and Europe, including Dr. Jacques Piccard and Cmdr. M. Scott Carpenter, are being lined up for the scientific sessions.

Company displays in the various technical areas will be presented in the exhibition halls adjacent to the Kongresshalle of the Munich Fair Grounds, Kallman noted. Space is available on a first-come, first-served basis. Additional information can be obtained from Kallman Associates, 30 Journal Square, Jersey City, N.J. 07306.

## ACM Denies SicSic Reinstatement

NEW YORK — President Bernard A. Galler of the Association for Computing Machinery, responding to a demand from a New York group that the Special Interest Committee on the Social Implications of Computing be immediately reinstated, warned the group not to use the ACM name and denied its demand. Galler told Robert M. Shapiro, who said he was SicSic secretary, that the society

had been completely surprised to hear Shapiro's claim and about the mailing list in his possession. The society said it had been unable to confirm the validity of Shapiro's claim from any files in its possession.

Galler pointed out that SicSic had failed to provide required reports to the ACM, and therefore had been dissolved. While welcoming the interest of Shapiro and his followers, he also directed attention to the activities of Robert Bigelow of Winchester, Mass., who is attempting for form a new SicSic, and of Dr. Anatole Holt, who had been the chairman of the previous ACM SicSic and now is ACM's representative on the Aflps Committee on the Social Implications of Computers.

## Codasy! to Mark 10th Anniversary

ATLANTA — The Conference on Data Systems Languages (Codasy!) will mark its 10th anniversary with a conference to be held at the Statler Hilton Hotel in Washington, D.C., on May 27 and 28.

This meeting will be primarily oriented toward future needs of the data processing community.

The agenda of the meeting will include the following topics:

1. Data Descriptive Languages.
  2. Data Base Extensions to Cobol.
  3. Procedural vs. non-Procedural Languages.
  4. Work toward one universal computer language.
  5. Data Processing Standardization Efforts.
  6. The Codasy! Survey on Generalized Data Base Systems.
- John J. Jones, P.O. Box 50204, Atlanta, Ga. 30302, is chairman of the executive committee.

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## Editorials

## ACM and the Afips Contract

Two months ago we asked the officers of the ACM to explain why they unhesitatingly ratified the new Afips constitution without debating or explaining its financial implications at a time when, unknown to either the ACM Council or the membership, the society was essentially broke.

Since then this subject has been dealt with by the president of the ACM, by Richard Canning who represents the ACM at Afips, and by Walter Hoffman who, at the time, was treasurer of both the ACM and Afips. We have considered all these answers carefully.

Naturally they differ somewhat. Hoffman stated that Afips could distribute all its income to its member societies if it wished, but more realistically, Geller said that there most likely would now be a number of new Afips activities.

However, some things were similar in all the answers. One was a lack of any figures. How one can consider the financial implications of a question without using figures is not obvious.

Another thing that was common was a lack of any explanation for the apparent haste with which the ratification was put through.

And a third similarity was a lack of any consideration of whether the officials might themselves be involved in a conflict of interest because of their positions within both the ACM and Afips.

In the meantime, we discovered that Simulation Councils, Inc., one of the other two members of Afips which ratified the agreement, had borrowed \$15,000 from Afips, and we realized the generally unsatisfactory condition of the books of both ACM and Afips. Under the circumstances, we feel that there is a need for a full investigation. The present data must be considered unsatisfactory and *Computerworld* now calls for the ACM Council at its next meeting to see that a full explanation is provided to the membership — provided frankly and without undue delay.

## Compatibility and Design

The action of the Department of Defense in supporting the use of plug-to-plug compatibility devices is to be welcomed. It is clearly absurd in this day and age to restrict users to any one manufacturer for all the devices connected to their computers, or to believe that the industry's engineering standards are so poor that it is not practical to interconnect devices supplied from more than one source.

It is also encouraging to note that the department does recognize that this means the end of the wet-nursing period is here. A vendor reasonably can be expected to take responsibility for only his own devices. Therefore total system responsibility must lie with the user in such cases.

However, it follows that a vendor should expect this and design his devices so that a user can take this new responsibility. This is probably the nub of the situation. If the available devices do not include, or include only at an extortionate price, the necessary means to allow a user to take this responsibility, then the freedom of the user is nullified just as effectively as if he were being forbidden to interconnect at all.



"Maybe I'm in the Wrong Business."

## Research Report

## Cobol Package Permits Use Of Shorthand, Pre-Auditing

Peter L. Briggs

cowritten with

Called Magic, a new package for Cobol users has been developed to permit the use of shorthand notation, to enforce the use of standards, and to permit auditing of programs prior to compilation. The package is produced by Information Management Systems, Inc. of San Francisco.

## Shorthand for Faster Coding

Using the feature of this pre-compiler called the Control Division, it is possible to use synonyms for any words in the Data Division. It also provides abbreviations for all reserved words in Cobol longer than four letters. One user of Magic told *Computerworld* that the time savings were great enough so that the installation had standardized on Magic. Every program written in Cobol has to be processed through Magic until a clean precompile-run occurs, he said.

It is possible to code only a few characters (see example) and from this to produce a fully formatted Cobol source program which has been edited for syntax errors and has expanded all coding into a standard form.

## Standards Enforcement

In installations where the desire is to use only one "standard" Cobol, the user can specify any words which should be either flagged for warnings or completely prohibited. When a source program is run through Magic, these selected conditions are tested and the errors indicated. If the prohibit option is used, then a "P" is placed next to the erroneous line.

## Auditing Capabilities

Suppose an installation desires to prohibit certain options of Cobol, such as the VARYING

option. Upon request from a user, the developer will alter certain sections of Magic and attach them to the compiler directly, so that no program can be run through the compiler without passing through the audit routines of Magic. This would permit installations with several computers to keep careful control of any violations of these standards, but without human checking.

The package runs on any IBM/360 with 32K or greater, under either T/DOS or OS, and can be used through the cataloged procedure library under OS to simplify the operation. If a return-code were passed from Magic indicating that errors had occurred, the compilation step would be aborted, thus saving machine time and improving turnaround.

Solomon L. Pollock, company

vice-president, pointed out that many users might not need these auditing features immediately but that each user would, sooner or later, face the problem of conversion to another system or massive maintenance of a programming system. When this situation arises, he said, Magic can provide careful control of all phases, without effort on the part of management. Conversion can be greatly simplified, when there is a monitoring program to keep track of what is being done, Pollock said.

The package has a price of \$8,000, which includes the programs, manuals, and a year's maintenance. Possible alterations for attaching Magic to a compiler would be extra.

The company has offices in San Francisco at 447 Battery St. and in New York at 11 W. 42nd St.

## Input to Magic:

```
PROC
SI SECT
ENTRY 'TEST' USIN LINKDATA,
IF S W GR 6 NEXT ELSE GO FLY-KITE.
```

## Output from Magic:

```
001500 PROCEDURE DIVISION.
001510 SI 'SECTION.
001520 ENTER LINKAGE.
001530 ENTRY 'TEST' USIN LINKDATA.
001540 ENTER COBOL.
001550 IF S W GREATER THAN 6
001560 NEXT SENTENCE
001570 ELSE
001580 GO TO FLY-KITE.
```

This example shows Magic's ability to expand predefined coding into an entire sequence of instructions in Cobol. The use of the ENTRY verb triggers the inclusion of the ENTER LINKAGE and ENTER COBOL statements.



## The Generation Gap — Part I

## Have the Burroughs 500s Bridged the Programmer's Generation Gap?

The Burroughs 500 series is an unusual one. The first 500 was announced in 1961 as the B5000. This was later rechristened the B5500 when its memory speed was increased. The Burroughs 2500 and 3500 came out last year and the 6500 is due for its first delivery this year. It is an unusual time spread for any computer family, and therefore brings up the question: Have the Burroughs 500s somehow managed to bridge the generation gap?

The problem of the generation gap is familiar nowadays, particularly to programmers. Computer generations have often been described in hardware terms. The first generation has been characterized by vacuum

tubes, the second generation by transistors, and the third generation by integrated logic. These are valid concepts from the point of view of the engineer. From the point of view of the programmer, however, the problem has not been in the particular characteristics of specific generations, but in how to move from one generation to another.

## Reprogramming Needs

The move from the first to the second generation was bad enough. The amount of reprogramming needed shocked many of the users in 1960. But the problems of moving from the second generation to the third generation shook the industry. Sometimes it took years to manage the transfer. Budgets were

hopelessly broken. Almost every month during the conversion period new and unsuspected problems occurred. So the problem of bridging the generation gap is one that is familiar to many CW readers.

## B5500 Still News

The Burroughs 5500 system is also becoming more and more familiar to CW readers. This winter we carried a story from one user on the advantages he found in operating one of the systems. He pointed to the lack of job control cards, and to the ease of communication and debugging.

Shortly after this, a news item was printed which discussed the ability of the B5657 to use more than one operating system

in its virtual memory, thereby allowing people from a terminal to determine without knowing many versions of the 360 operating systems they wanted to run their program. CW immediately received many letters from readers pointing out that this was nothing new. "Our B5500 has been doing it for months!" they said.

We found these letters very interesting because they represented an outpouring of loyalty from users of one of the oldest systems, a loyalty which in its intensity of feeling was unique in our experience.

These users had no fears of future incompatibility. They were obviously sold on the systems — and it is a fact that the B5500 is still in new production status, while many IBM 360s dropped out of that state last year!

## How It Was Done

These two factors then led us to suspect that somehow, from the point of view of the programmers, the B500 had conquered the generation gap.

To see how this appears to have been done, we have to go back to the beginning of the system.

The first of the 500s, the B5500, is an unusual system from the programmer's point of view. It is based on high-level languages, on Algol, Fortran, and Cobol to be precise, rather than on a machine language or assembly program. From the very beginning, Burroughs has made it clear that any user of machine language could not expect support when the operating systems changed. Few users did after their first experience. The Burroughs systems have always had an operating system; it was one of the design elements. The main one is called the Master Control Program or MCP for short. This master programming takes in the user's problem program written in high-level languages and compiles it, stores it, and executes it as needed.

## MCP's Role

The key point is that the MCP makes all the nitty-gritty decisions about how to store working areas, what sort of code should be produced, how and where labels are to be checked, etc., by itself. These are not the programmer's concern; he is interested only in the functions that the program performs and in whether he has asked for them correctly.

## Characteristics Changeable

As a result of this characteristic, through the years Burroughs has been able to change totally the way programs are written at machine level without involving the original programmer. There have been three very major changes in the way programs are written.

At one time, for instance, it was decided that considerable efficiency could be gained if the programs were made "re-

entrant." This involves a technique of programming which insures that no modification is made to the program itself during its execution. As a result, it is not necessary to store a program on a disk if it is bumped during execution by a higher-priority program. Accordingly, Burroughs wrote a new version of the MCP and new versions of the compilers, which created re-entrant programs. Burroughs then distributed this new version to its users who just recompiled and again had their old programs running — but with a new technique that they could now take advantage of without any re-writing consideration.

## Programmers Were Not Involved

This was possible because none of the user programming was involved in worrying about the space now required to control the re-entrant characteristics, nor were any machine-level language programs around with incompatible references.

## Repeated Caves

And this wasn't the only case. Communications capabilities were added by the same method. What was involved was that user programs were being "jacked up" and a new operating system with updated characteristics was being installed underneath them. The latest change of this type was the addition of time-sharing capability, again without involving the users. The programs that had been written originally were still running, but now they could run in time-shared mode.

## User Reaction

Naturally the users were delighted — as CW found when it talked to them. They found themselves being pleasantly updated without having to reprogram and without having added incompatibilities appearing in files. They were not having to learn new job control languages and they were able to look forward to conversions with confidence. There is no doubt whatsoever that they believe that Burroughs has bridged the gap between the different generations of programs, and they see no reason why it should not now bridge the generation gap between different generations of systems.

## Doubts Still Exist

However, there are still some doubts on the outside. Some users point out that nothing is won without cost and wonder whether or not the cost is worth it. In particular they wonder why, if the Burroughs system is so outstanding, the other manufacturers have copied it in the many years that have gone by since 1961.

We will consider the cost next week and the reasons why some of the other manufacturers have not yet copied the B5500.

## Letters to the Editor

## Designer Denies Vote System Can Be Subverted 120 Ways

It was with great interest that we read your article concerning IBM and its discontinuance of vote tabulation activity [CW, March 19]. Several statements were made concerning the validity and accuracy of the Voteomatic System generally, and the Los Angeles system in particular. Because we designed, created, and implemented the software used in both the city and county of Los Angeles, and because we are proud of the results of our work, we feel it incumbent upon us to take issue with some of the charges contained in said article.

Best of mind, if you will, that we are considering only that part of the system concerning with the actual use of the computer.

There are three distinct areas where any data manipulation of a nefarious nature could be attempted:

1. Ballots entering the system.
2. Interim stage between programs.
3. During actual tabulation.

First, the ballot as it enters the system is most vulnerable to hanky-panky. But this is true of any type of ballot and any would-be meddler would have to know exactly which column/row positions to punch in order to cause an actual change. Since a punch obviously cannot be removed, the result would probably be an invalidation of the particular race or issue, since any additional punches would most likely result in an over-vote situation. In addition, due to ballot rotation, any particular column/row punch will not always apply to the same specific ballot title, making successful alteration very difficult. As the ballots are loaded to tape, they are precinct-checked and counted. This count is later matched against the precinct poll book, thus disclosing if more ballots were read in than there were people voting.

In the second stage, between programs, the ballots are stored on tape. These tapes are transferred by their creation points to the central computer for processing by uniformed police officers. We maintain that it is manifestly impossible to alter a segment of magnetic tape at the byte level without rendering the entire tape useless; i.e., erasure, etc.

Which brings us to the third possibility, the actual tabulation of the votes. These tapes are translated by a rather large group of sub-programs called (together) the "Summary Information Program" (SIP). The main functions of this program are: to tabulate and store results by precinct, to produce, on request, a variety of reports indicating the status of the election. With regards to tabulation, the ballots are read from tape, counted again, and then the actual votes are recorded in core. When an entire precinct has been entered, the results are stored on a prefor-

matted disk file. The file must be zero to start and no precinct may be entered twice which insures no tampering with the physical disks themselves. Each file is maintained in duplicate so that in event of power failure, drive failure while writing, etc., only the current entry need be recreated. Sip has restart capabilities for such contingencies and can recover from practically any disaster in 10 minutes.

In addition, there are various sequence checks, special check digit tests, etc., which are continually in use throughout the running of the program. For obvious reasons, we cannot reveal them to you, but we feel that they safeguard the voter's franchise beyond all other systems now in use and we are quite confident that while our system may not be infallible, there are substantially less than 120 ways to subvert it.

Lance W. Clifford

Comtek, Inc.  
Portland, Ore.

## He Defends IBM's 2361 LCS As Faster Than CW Reported

The announcement of Lockheed's mass memory for 360s and 490s [CW, April 9] is a welcome step forward in large-memory technology. Your article, however, erroneously reported the access time of IBM's 2361 LCS unit as 8 microseconds per byte. In reality, LCS access time is model and option dependent. On the Model 50 the access time is 8 microseconds per 4 bytes (effective time of 2 microseconds per byte). On the Models 65 and 75 LCS access time is dependent on interleaving and is either 8 microseconds (per microsecond) or, with interleaving, 4 microseconds effective time with access to 8 bytes (1 byte per 500 nanoseconds). In no case, however, is the access time 1 byte per 8 microseconds as was reported.

Lance H. Vaughan

Boston

The phrase "per byte" was erroneously added during a rewrite. Sorry. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. Computerworld reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 60 Austin St., Newton, Mass. 02160.

## Computer Acts As Laboratory In Secondary School System

HUNTINGTON, N.Y. — Can the computer in the secondary school function as a laboratory, enabling students to comprehend concepts presently beyond their grasp, or is it a programmed instructional device?

If early results of a two-year study underway in Suffolk County are an indication, the computer can be made to function as a laboratory.

This is the goal of the "Huntington Project," so called because most of the high schools involved are in the town of Huntington.

In the project schools, the computer, either a small PDP-8/I from Digital Equipment Corp. or a terminal to the large time-sharing system operated by Pillsbury Occidental's Call-A-Computer, has been made to serve as a modeling device in the study of biology, chemistry, physics, mathematics, and social studies. Since January, teachers have devised more than 80 programs for student use.

Typical of the teachers using

the computer to simulate experiments previously impossible is Mrs. New Cort of Walt Whitman High. The school's PDP-8/I has been equipped with a switch, giving Mrs. Cort and her biology class complete control of the computer for a variety of experiments.

A secondary purpose of the National Science Foundation-funded "Huntington Project" is to determine whether it is better to have a computer on hand, or if time-sharing can be made to suffice, according to Prof. Ludwig Braun of the Polytechnic Institute of Brooklyn at Farmingdale, N.Y., the project's director.

While no final evaluation of this question has been made, one thing is apparent to most of the 45 teachers and 1,200 students taking part: More input devices are needed. Both the PDP-8/I's and the time-sharing terminals have created so much interest that there is not enough time to satisfy teacher and student demands.

Of the two approaches, however, the small computer appears to have some very definite advantages. For example, Mrs. Cort found it difficult to gain access to the large system on occasion.

The PDP-8/I, with 4,096 words of basic core memory and 32,768 words of disk storage, cost \$19,300, less than the price of a time-sharing terminal for two years.

While it does not possess the large variety of programs nor the ability to act as a file of student and teacher programs for all schools in the project, the advantage of the small computer is that the purchase price is a capital expenditure. There is no yearly rental involved.

Warren Houth, in charge of the PDP-8/I at Walt Whitman, also pointed out that the Focal conversational computer language available only with the PDP-8/I has decided advantages for those with no programming experience.

## Library Systems Studied By ITT Research Institute

CHICAGO — The feasibility of developing cooperative procedures for sharing resources between six regional library systems in northern Illinois is being studied by ITT Research Institute here. Over 200 individual libraries comprise the six systems supporting the study.

The institute will study current operating procedures of the participating libraries and will investigate possibilities for introducing automatic data handling techniques. The study is expected to lead to recommendations for cooperative procedures permitting the systems to obtain and exchange information rapidly about their book collections and other educational resources.

Standardized cataloging rules and magnetic tapes offered by the Library of Congress in its Marc II (Machine readable cataloging) project will be reviewed as a basis for organizing standard operating procedures for participating libraries. The bibliographic data system designed during the first phase of the project can provide a basis for automated acquisition and circulation operations which could be used in the future by member libraries.

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## New Literature

A series of specialized reports designed to reflect the results of the research and development efforts of the National Computing Centre of Manchester, England, has been initiated.

Titles published to date include: *Computer Courses 68/69*; *Computer Application Packages*; *Computer Aided Production Control*; *Commodity Coding*; *Computers in Distribution*; *Computers in Textiles*; and *International Computer Bibliography*. Reports are available by subscription only. Contact Nancy Bauer, Science Associates, 23 E. 26th St., New York 10010.

A new brochure, *Job Documentation by COI/360* describes the job documentation that users will receive with the control language translator for JCL upon its implementation in IBM 360 operating systems. AIM, 16033 Ventura Blvd., Encino, Calif. 91316.

Four new information bulletins describe computer graphics as a management tool, SCOPIT, 3-40 applications software, and the GPKC contouring program. California Computer Products, Inc., 305 N. Muller St., Anaheim, Calif. 92803.

A new bulletin describes the performance specifications of the Ampex 25M-500 magnetic

core memory. Request brochure C-099 from Lee Westfall, Mail Stop 7-14, 401 Broadway, Redwood City, Calif. 94063.

A new brochure describes a new business concept of total systems responsibility with turn-key contracts.

A detailed, functional flow diagram shows entwining involvement of project management, total system responsibility, and consulting services.

Digital Applications, Marketing Services Dept., 866 Third Ave., New York 10022.

A complete description of Coded-Cap, a conversational circuit-analysis program, may be obtained at no cost from Product Information Dept., Comshare, Inc., 1915 W. Stadium Blvd., Ann Arbor, Mich. 48106.

*Computer Literature Bibliography*, Vol. 2 is a continuation of *Computer Literature Bibliography*, 1946 to 1963 and contains approximately 3200 references to computer literature published during the years 1964-1967. The bibliography section includes the full title and the names of all the authors of each item. Price is \$5.

Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

## School Offers Tuition Refund Plan

FAIRFAX, Va. — The National Bank of Fairfax, and Computer Age Institute, Fairfax, have developed a tuition loan plan with a liberal refund provision for students accepted by the institute.

This provision permits a student to receive a refund of his tuition commitment amounting to as much as 100%, according to a spokesman at Computer Age Institute.

If the student withdraws before the first day of the course, he receives 100% of the tuition,

including the \$175.00 initial payment and registration fee.

If he withdraws before having completed 100 hours of time, he receives 75%; before 150 hours, 50%; or before 200 hours, 25%.

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## Jockey Club Utilizes Computer For Choice Breeding Information

By Joseph Hanlon

LEXINGTON, Ky. — A computer research program on bloodlines and breeding records could benefit the entire thoroughbred racing industry, according to the Jockey Club.

The club, the organization responsible for the registration of thoroughbred race horses in this country, is using an IBM 360/30 to register and compile records on all horses foaled in the United States and Canada since 1927.

The purpose is to make reports expected to produce more selective breeding results, establish better measures of the actual genetic traits affecting racing ability, provide decision analysis tools for the entire industry, and predict the relative success of untied horses.

An offshoot of the correlation of this data is producing, for the first time, a complete analysis of race horse breeding, performance, and earnings, according to Ray Gillespie, manager of data processing for the club.

"Our major commitment at this point," he said, "is to work closely with club officials in speeding the registration of thoroughbreds. However, as a long term project, we are working on a system for rating horses based on their genetic makeup and racing performance."



Racing's most successful sire, Bold Ruler, is shown here with Arthur Hancock of Claiborne Farms. Having sired some 80 stakes winners, his breeding record is of immense interest.

The genetic analysis will be applied to untied horses. The performance of his parents and brothers will be analyzed to predict, fairly closely, Gillespie feels, what each horse can or cannot do. The club hopes that this will aid racetracks everywhere in setting up races in which the horses have comparable abilities.

In explaining the need for a computer to process the information, Gillespie pointed out that, whereas only 13,257 horses raced in 1940, now some 40,661 horses race. Information about each horse is collected as soon as the horse starts racing and is updated with earnings and records for each race.



A scintiscanner is adjusted over a patient in preparation for making a scan of radioactive isotopes in his thyroid gland.

## Computer Techniques Aid In Detection of Cancer

NEW HYDE PARK, N.Y. — Anatomical hide-and-seek is becoming passé as doctors apply the techniques of nuclear medicine and computers to the difficult problem of detecting cancerous growths in the human body.

Doctors at Long Island Jewish Hospital here have teamed a Honeywell computer with a scintiscanner to find thyroid and brain tumors in patients and to pinpoint the locations and size of the growth.

Until recently the physician relied almost exclusively upon his clinical examination and the x-ray machine to find and locate tumors. X-ray technicians photographed the patient as instructed by a radiologist who later

searched the x-ray looking for tell-tale changes in the light and dark areas that might be tumors.

Although still extremely useful, this technique does not pick up all tumors. The difference in shading in the x-ray picture may not be sufficient for diagnosis even when enhanced by injection of special contrast materials.

Still under evaluation, a more recent approach uses computers to examine the x-ray since the machines can detect as many as 100 shades of gray. The technique was derived from the military application which uses computers to examine aerial photographs of enemy terrain for troop and equipment concentrations.

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## Penn Central to Install Quick Reservation System

PHILADELPHIA — Penn Central will install an advanced, computerized system to expedite passenger ticketing and reservations on its new Metroliner high-speed trains operating between New York and Washington. It is planned to have the new service operational by mid-summer.

Under the new system, a single reservation and ticketing procedure will be completed in approximately 20 seconds. The selection of a seat will remove it from the inventory.

The equipment was developed by Ticket Reservation Systems, Inc., of New York City. Eventually, Penn Central will expand this ticketing and

reservation system to all trains serving the Washington-New York corridor.

Installation of console-printer units at station ticket windows in New York, Newark, Trenton, Philadelphia, Wilmington, Baltimore, and Washington will proceed as rapidly as the equipment can be obtained and tied in with master computers, a spokesman said.

"All the ticket clerk will have to do is press several buttons on the console," said Robert G. Flannery, vice-president for operations. "If the space on the train desired is available, the console will immediately print a ticket showing the Metroclub seat number, car designation, train identification, fare, and date. If the ticket is for a coach passenger, the ticket will have an identifying color stripe which replaces the present boarding pass needed to admit passengers to the train."

"At the same time, a Teletype beside the console will record the transaction on paper," he continued. "The equipment also will do the clerk's bookkeeping, showing him at the end of his tour of duty how much money he should have in his cash drawer."

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### On the Beam

This experimental light deflector switches a laser beam from one spot to another in 36 millionths of a second. Designed and assembled at the IBM Systems Development Division laboratory in San Jose, Calif., the deflector operates at speeds required in future optical memories.

## Thermal Page Printer Serves As Input/Output Terminal

UPPER SADDLE RIVER, N.J. — A thermal page printer designed for use as an input/output terminal has been announced by Computer Transfer Systems, Inc.

Designated the Execuport 300, the unit has a 96-character set, including full ASCII, upper/lower case alphabet, and special characters, a company spokesman said.

The unit operates from any location where an ordinary electrical outlet and telephone are available.

In operation, the user will dial-up a remote computer, put the headset in a coupler cradle, and type input from the keyboard. Both input and output

are printed.

The unit has output rates of 10, 15, or 30 characters per second, operator-selectable, the



Execuport 300 terminal printer

spokesman said.

Execuport is priced at \$3,800 for a single unit, with quantity discounts available, he said.

Production deliveries are to begin in the third quarter.

The company has offices at 123 Pleasant Ave. here.



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### Used Computer Market Gains Sophistication

NEW YORK — The business of leasing and selling used computer systems is becoming more sophisticated, with companies offering added services to the users.

Typical of this change is IOA Data Corp. which now offers its customers the consulting services of Worldwide Computer Services Inc.

"We are now able to provide our customers with a complete package of hardware and related software," said Stuart Rubenstein, chairman of IOA Data Corp.

It used to be that a user knew exactly what equipment he wanted, an IOA spokesman said. But now, with the complexities of modern systems, the user often needs help in deciding how to update or revise his installation, and that's where Worldwide comes in, he said.

IOA, with offices at 383 Lafayette St. here, owns 20% of Worldwide, which is the basis for the working relationship, the spokesman said.

### Japan Schedules Business Show

TOKYO — Japan's 20th Business Show will open May 23 with an array of computers, business machines, and office products from approximately 200 manufacturers, both Japanese and foreign.

The show, to be held at Tokyo's Harumi Pier exhibition grounds through May 28, is expected to draw close to half a million visitors from all over the world.

According to the Ministry of International Trade and Industry (MITI), Japan's computer production totaled \$455 million last year, up 40% over 1967.

The show is held twice a year, the site alternating between Tokyo in the spring and Osaka in the fall. It is organized by the Nippon Office Management Association and the Tokyo Chamber of Commerce and Industry.



April 23, 1969

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## Real Estate Service Offered

DALLAS — A computerized real estate marketing system which can put realtors, other brokers, investors, lenders, exchanges, buyers, and sellers into immediate contact on a nationwide basis is now available through Associates, Inc. AI is using its Dallas data processing center, one of four such centers in northern Texas, where an IBM 360 computer is controlling a telecommunications system.

This system includes Touch-Tone telephones, audio response, Teletypes, and visual displays which come with an optional printer. Any member utilizing the system, the company said, will have access to what will become the largest inventory of real estate listings anywhere in the world.

The system is such that it can handle residential, commercial, industrial, and agricultural property listings. This Realtor Inquiry package was developed by AI's teleprocessing staff for one of its major clients.

## System Helps Students To Probe Job Interests

LAS VEGAS, Nev. — The Interactive Occupational Exploration System, a personnel guidance system, was introduced at the American Personnel and Guidance Association convention in Las Vegas.

The new system is intended to aid students in exploring various occupational possibilities and will supplement Interactive Learning System's existing Guidance Assistance Programs.

The system is designed for use by the student in the high school guidance office. Application of the system may also be made on the junior high school and junior college levels. Access to the computer data file is by means of a standard teletype writer located in the guidance office.

The data file contains information about thousands of occupations coded from the U.S. Labor Department's *Dictionary of Occupational Titles*, an interactive spokesman said. The student inputs characteristics which are important to him in choosing a job, and the computer responds with a list of occupations having these particular characteristics. Each job is described by 15 categories such as work activities, physical demands, working conditions, earnings, education required, and advancement, he said.

## Simu8s Price Cut to \$1,500 By Developer

SAN DIEGO, Calif. — Users who are currently interested in, or considering purchasing Simu8s (an assembler for, and simulator of the PDP-8 series computers) can now obtain the package at a reduced price.

The new price for the package plus documentation and support is \$1,500. On-site training from the developer, Decision Sciences, Inc., is available for \$450 plus air fare.

The package operates on the 360/40 or larger and the CDC 3600.

The company has offices at 4508 Mission Bay Drive here.

The system is believed to be the first in the country utilizing an on-line computer to retrieve data about occupational descriptions, he said.

Interactive has offices at 16 Soldier's Field Rd., Boston.

## Program Edits List Tapes in One Pass

LANHAM, Md. — A program which dissects identified fixed-field name and address computer tape files and isolates item within each field has been introduced by Softpak Inc.

The new program eliminates the need for multiple computer passes in editing tape lists and is particularly useful in tape-to-tape list preparation for producing personalized computer letters, rosters, and photo-composition directories, a Softpak spokesman said.

In the name field, name prefixes, first or middle name, and name suffixes can be extracted, he said. These items can be converted to upper and lower case; abbreviations can be punctuated properly; or the full word can be inserted via a table look-up process (i.e., the abbreviation Dr. can be spelled out Doctor). Last names with double capital letters such as MCARTHUR can be converted to McArthur and O'DONNELL to O'Donnell, he said.

In the street and city/state/zip fields, abbreviations such as Ave. or PA can also be spelled out in full. At present MAC, O', D', and A' names are translated with the parameter look-up table, he said.

The program can be purchased individually for \$950 or as part of Softpak's complete file maintenance and computer letter system (CAMS) for \$600. The program, either the edit package or CAMS itself, runs under DOS/TOS on S/360 with 32K.

## IBM Preparing a Better Version Of PL/I F-Level OS/360 Compiler

WHITE PLAINS, N.Y. — Major improvements to IBM's PL/I F-level compiler for OS/360 have been announced.

Version 5 of PL/I (F), scheduled to be available in the first quarter of next year, will include the following improvements:

- Faster execution speeds for scientific programs through more efficient generated code and the use of optional loop and subscript optimization phases.
- Language extensions and

other new options which make available to the PL/I user many of the message-processing facilities of OS/360 Queued Telecommunications Access Method (QTAM).

- Expanded data handling functions facilitating data conversion, validation, and input editing.
- Reductions in storage requirements for two-byte binary data through the use of the half-word binary capabilities of System/360.

## Typesetting Language Is Developed

CW Staff Writer  
NEW YORK — A new computer language called Page-1 that the company expects will have the same effect upon the use of computers in the graphic arts industry as high-order languages such as Fortran and Cobol had on the computer business, is available now from RCA's Graphic Systems Division.

Page-1 allows graphic arts per-

sonnel unskilled in computer programming, and programmers with a rudimentary knowledge of typesetting, to tell a computer exactly how to handle all aspects of composition, the company stated. A simple system of code words marked on the original manuscript defines format, type faces and sizes, justification, hyphenation, pagination, footnotes, and captions.

## Bank's Installment Loan System Now Available to Other Users

BOSTON — A new installment loan system, developed by and for the First National Bank of Boston, is being offered and maintained through the Cullinane Corp. here.

The package, which operates on a 360/30 with 65K memory and at least four tapes or disks, is written in Cobol and has been successful at the bank for some time, a Cullinane spokesman said.

The system features, for the loan officer, up-to-date payoff amounts for each loan, up to 99 different loan-type classifications, indirect loan reporting, management statistics, and automatic closure of small balances, he said.

To facilitate correspondent banking, the package includes several accrual methods, check digit calculation routines, option codes for report selection, and complete freedom of selection for the cycle period of late and delinquent notices and late charge assessments, he said.

Input to the system can be in

the form of either cards or paper tape, using batch-control tickets to provide input balancing. The primary report from the system is called the Consumer Credit Reference Listing, which contains current balances, payoff amounts, and other pertinent information regarding each account, the spokesman said. A

daily activity listing is produced, and the consumer report is produced weekly. Other reports are available with the package as needed.

Price of the package is \$15,000, which includes manuals, operating instructions, installation manuals, and training guides.

## Utility Company Package Handles Billing, Accounting

ORLANDO, Fla. — A new billing and accounting service package being developed by Florida Gas Co. with those from leading utilities all over the nation," says Ed Skinner, FCS general manager, "will develop the nation's first modern computer system that will effectively cross all utility industry lines."

Called Fubs (Florida utility billing system), the system is designed to serve the needs of over 300 utilities in the state as

well as those of Florida Gas Co. "We've incorporated the best techniques learned at Florida Gas Co. with those from leading utilities all over the nation," says Ed Skinner, FCS general manager, "will develop the nation's first modern computer system that will effectively cross all utility industry lines."

### System Functions

Functions of the system include delinquent notices sent automatically to late-paying customers, and automatic credit rating procedure that evaluates customers based upon their payment history (which reportedly could drastically slash bad-debt write-offs), and management reports which show up to 14 months' history for each utility customer, he said. The system also automatically performs regular meter reading processing, regular billing with automatic posting of cash payments, delinquency analysis, merchandise and lease accounting, gross and net billing, automatic accounting journal entries, and even bill analysis reports for rate-study purposes.

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WASHINGTON, D.C. - Air pollution, a controversial and serious problem in our cities, is now being subjected to a computer-oriented study by TRW Systems Group under agreement with the National Air Pollution Control Administration.

The computer will be used to produce an analysis of the regional nature of the pollutants and geographical types of pollution to facilitate regional control and special handling of local problems.

TRW will also be conducting studies into effective techniques for controlling special types of pollution and the further development of these techniques within the regional definitions at which the study arrives.

At a higher level, the regional analyses will be used to develop effective national policy which, it is hoped, will facilitate this regional control. Long-range studies also are being undertaken to prevent, if possible, large-scale pollution from striking areas which have avoided the problem so far.

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April 23, 1969

Page 21



Table-sized remote terminal will be used for financial OTC analysis.

## OTC Data Bank Available From Standard & Poor's

NEW YORK — Standard & Poor's Corp. unveiled before a recent gathering of financial editors a new, computer-readable data bank which, for the first time, enables the financial performance of companies whose stocks are sold over the counter to be analyzed as extensively as those listed on the New York, American, and regional stock exchanges.

Use of the OTC data bank is not restricted to firms large enough to possess their own computers, since Standard & Poor's will lease the bank to time-sharing service organizations around the country. The data, which is contained on magnetic tape, consists of detailed financial information for each year of a company's operation dating back to 1963, or year of inception if later.

It includes annual income statement and balance sheet statistics collected from annual reports, SEC reports and, in many cases, from direct correspondence with corporate officials.

Much of it, claims the company, is not readily available anywhere else. Where necessary, figures have been adjusted for comparability in accordance with accounting definitions developed exclusively for this purpose.

Remote terminals which resemble a television screen with an attached keyboard, and which are connected to a centrally located computer via a telephone line, permit subscribers to request data and see replies appear on the screen before them, according to the company.

The initial version of the data bank contains data on 500 of the most actively traded OTC stocks. By June of this year the number of companies will be expanded to 1,000, and by the end of 1969 a total of at least 1,500 companies will be included.

Along with S&P's daily price tapes, the OTC data bank will enable analysts to perform up-to-the-minute, in-depth analysis of practically any nature.

The new OTC data file represents the newest category in Standard & Poor's overall financial data bank service which is known commercially as Computat. In addition to the first increment of OTCs, the Computat inventory now consists of data for the past 20 years on each of 2,500 companies, including all industries on the New York and American Stock Exchanges, 100 utilities, over 200 insurance companies, and 500 computer areas.

Currently in the process of development is still another new category covering banks, savings and loan companies, management firms, mutual funds, and mutual fund management companies.

## RCA Report Emphasizes Computers

RCA sales and earnings in the first quarter of 1969 advanced to new all-time highs, continuing the pattern of growth that has produced seven consecutive years of record progress, according to Robert W. Sarnoff, president and chief executive officer.

The RCA chief executive found promise for the future in various aspects of the company's diversified operations, with particular emphasis on advances in the computer area.

He said domestic computer revenues in the first quarter were up 43% over a year ago.

"We are moving well ahead of the industry in terms of computer growth," Sarnoff said. "In the last three years, our domestic computer shipments have increased 120% in dollar value, compared to an industry gain of 58%."

"We believe we are in the vanguard of new computer technology, with our primary effort concentrated in the growth areas of computer communications and time-sharing. We are taking aim at second place in overall industry ranking, and we hope to attain it in the foreseeable future," Sarnoff said.

## Mohawk Data Sciences, Photon Discose Agreement in Principle

BOSTON — Mohawk Data Sciences Corp. and Photon, Inc. have announced that an agreement has been reached "in principle" to combine the businesses of both their companies.

The proposed merger would give stockholders of Mohawk one share of the "continuing company" for each share of stock presently held, and stockholders of Photon would get 0.4 share of the continuing company for each share of Photon.

The merger is contingent upon the satisfactory resolution of legal, financial, and administrative details, and the preparation of the definitive merger agreement which will be submitted at a later date for approval by both boards of directors and the shareholders of each company.

The proposed merger is expected to qualify as a tax-free exchange for federal income tax purposes, although it has not yet been decided if a tax ruling will be sought, according to the company.

V.E. Johnson, chairman of the board and president of Mohawk, and R.M. Compston, president of Photon, in a joint release stated, "the prospects of both companies should be considerably enhanced through the proposed combination."

Although company officials have not said which company would be the surviving company, a spokesman close to the company believes the continuing company will be called MDS-Photon Inc.

"By taking advantage of common facilities, jointly developing

new projects, supplementing MDS's large field support network with Photon specialists, expanding the rental program of MDS with Photon systems, and by combining MDS's entry, communications, data collection, and media conversion equipment with Photon computer and key-driven phototypesetting systems, the new organization would have one of the broadest lines of auxiliary data processing equipment and marketing support ser-

vices offered by any independent manufacturer in our industry."

"The benefits accruing to such an enterprise, which would represent a new force in the data marketplace both here and abroad, could be substantial."

Photon, Inc., traded over-the-counter, manufactures and sells phototypesetting equipment to the printing, publishing, data processing, and graphic arts industries.

## Terms Announced Between Honeywell and Collins

MINNEAPOLIS, Minn. — Honeywell Inc. and Collins Radio Co. have announced the proposal through which Honeywell would acquire Collins.

The agreement, released in a joint statement by James H. Binger, Honeywell chairman, and Arthur A. Collins, president and chairman of Collins, proposes the acquisition "on the basis of 56/100 of one share of common stock of Honeywell for each of the outstanding 2,967,427 shares of Collins common stock."

At recent stock prices, the value of this proposal is in excess of \$200 million.

The companies also indicated that "consummation of the transaction will be subject, among other things, to the approval of the terms by the board of directors of both corporations

and to necessary director and stockholder approval of a definitive agreement." There is a possibility that approval by Honeywell shareholders wouldn't be needed.

Collins is presently fighting a proposed takeover by Electronic Data Systems that Collins terms "hostile to the interest of the company."

In fiscal 1968, ended last July 28, Collins had a net income of \$13 million, or \$4.44 a share, on sales of \$44.7 million, up from \$12.1 million, or \$4.42 a share on sales of \$43.8 million in fiscal 1967.

In comparison, in all of 1968, Honeywell had a net income of \$50.5 million, or \$3.41 a share, on sales of \$12.28 billion, from \$42.3 million, or \$2.85 a share, on sales of \$1.05 billion in 1967.

In announcing the record quarter, D.P. Booth Jr., chairman, stated that the company now has \$180 million committed to computer systems in the United States, Canada, and Europe.

Revenues reached an all-time high of \$9,033,686 and earnings were \$711,700, or 43 cents per share, on 1,666,117 outstanding

shares for the first quarter ending March 31.

This compares with revenues of \$1,458,353 and earnings of \$176,937, or 14 cents per share, on 1,270,000 outstanding shares for the same period a year ago. (Actual earnings were \$84,216, or 7 cents per share, before a 1967 tax loss carry-forward was utilized.)

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### Booths Reports Record First Quarter Revenues

SAN FRANCISCO — Booth Computer Corp. reported record first quarter revenues and earnings at the annual stockholders meeting on April 8.



## Informatics Buys Rucker Data Centers

SHERMAN OAKS, Calif. — Informatics Inc. has completed the purchase of two computer data centers from The Rucker Co., Oakland, Calif. For 148,000 shares of Informatics stock with a current value of over \$3 million.

Dr. Walter F. Bauer, president of Informatics, said that the data centers, located in Oakland and Los Angeles, will be combined with a third center in the San Fernando Valley. Informatics data centers will operate seven medium-scale IBM computers in the three centers.

"Plans are already being made to put the Informatics centers on-line to bring data services into the customer's office," said Bauer.

The Informatics service would be a complete package, he ex-

plained, including systems analysis, programming, on-site procedure development, and customer personnel training in operations and Mark IV programming.

Bauer said the Rucker data center acquisition is a step toward the establishment of data centers nationwide.

Informatics also has agreed in principal to purchase 70% interest in Dataplan, Inc., New York-based subsidiary of Interpublic Group of Companies, for \$1.6 million cash.

### Honeywell Receives U.S. Job-Training Grant

WELLESLEY HILLS, Mass. — Honeywell's Electronic Data Processing Division has received a two-year, \$396,000 grant from the U.S. Department of Labor to train 130 persons in computer

production work.

Thomas R. Lawrence, a manpower resources specialist for Honeywell EDP who will head the program, said training will begin in June at the division's facility on Soldiers Field Road in the Brighton section of Boston.

The first class will comprise approximately 26 persons. Students, both men and women, will receive 13 weeks of orientation and skill training at the Brighton facility before going to an EDP production line for on-the-job training.

Lawrence said the students will receive training in such jobs as wiring computer backboards and building printed-circuit boards, and some of the students will be trained as production line inspectors.



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## Computers: What's their future?

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# BankAmerica Buys Services Firm

SAN FRANCISCO—BankAmerica Corp., the one-bank holding company of the Bank of America, has received government approval for its first acquisition—a computer services company. The acquisition is based on an agreement for the purchase of an 80% interest in Digital Corp. of San Francisco for \$5 million.

The announcement was made jointly by Rudolph A. Peterson, president of both the bank and the holding company, and President John A. Margos of Digital Corp.

Digital Corp. was formed in February by a group of men formerly associated with IBM. It is engaged in leasing of computer systems, software programming, and management consultant services relating to computer operations.

## Levin to Increase Shares

NEW YORK—Levin-Townsend Computer Corp. has called a special shareholders meeting for April 30 to consider a proposed increase in authorized shares to 15 million from its present 10.5 million.

The 10.5 million authorized shares consist of 10 million common and 500,000 preferred shares.

The increase in number of shares will permit the board to designate various classes of stock among the 5 million authorized.

shares, while the other 10 million authorized shares will continue to be common stock, according to the company.

## NCC Leasing Sells Out \$5 Million in Debentures

NEW YORK—The offering of \$5 million convertible subordinated debentures by NCC Leasing, Inc., Memphis, Tenn., due 1999, was sold out, oversubscribed, and the books closed underwriters, Hochteller & Trotter, Inc.

The company is engaged in the business of purchasing and leasing computer and general equipment as well as engaging in the making of short-term commercial loans.

The executive office of NCC Leasing, Inc., is located in Memphis, with branch offices in Chicago and Atlanta.

The company will use the net proceeds to repay short-term debt and other indebtedness as well as to finance the acquisition of

additional computer and general equipment for lease to others.

## GSI Computer Stock Sale Oversubscribed

NEW YORK—GSI Computer Inc.'s first public offering of 500,000 shares of common stock was immediately oversubscribed after reaching the market at \$27 a share.

Underwriters, led by S.D. Fuller & Co., said they exercised their over-allotment privilege and sold an additional 500,000 shares to buyers who didn't receive stock.

The offering, worth \$13.5 million, had been reduced from 1 million shares because of difficulties with regulations in a number of states.

The Danbury, Conn., computer services and graphic communications company will use the proceeds to increase working capital and to repay its parent company, Graphic Sciences Inc., which owns about 80% of the 2,550,000 common shares outstanding.

## New Registrations

OPTOSTATIC SCIENCES, INC., 3249 Winston Rd., South Rochester, N.Y. 14623, a company which plans to design, develop, manufacture, and market electronic devices and computer systems, software programming, and management consultant services relating to computer operations, filed to register 400,000 shares of common stock. Proceeds, at \$5 per share, will be used to finance the design, development, and marketing of an electronic office copier product and for the development of a computer consulting service division for the design of optical systems and scanners, and for working capital. No underwriter is involved.

COMPUTER CAREERS INC., P.O. Box 431, Town of Newburgh, N.Y., a company engaged in the operation of a data processing school and the furnishing of a magnetic tape cassette typewriting and colotype composition service, filed to register 150,000 shares of common stock. Proceeds, at \$6.60 per share, intended to repay short-term bank loans, to establish and operate a combined data processing school and MTS/colotype activities in Endicott, Hartford, and Newburgh; to promote the Newburgh school; to meet costs of the company's proposed software operation, and to provide working capital. The underwriter is R.W. Smith, 1400 Alamo National Bldg., San Antonio, Texas 78204.

COMPUTER INVESTORS GROUP, INC., Symphonette Square, Larchmont, N.Y. 10538, a company engaged in a holding company operating three subsidiaries, one of which is engaged in the business of purchasing and leasing to other electronic data processing equipment, filed to register 125,000 shares of common stock. Proceeds, at \$12 per share, will be used to finance the development, marketing, advertising, and sales of computer software, hardware, and consulting, and general corporate purposes. The underwriter is R.W. Smith, 1400 Alamo National Bldg., San Antonio, Texas 78204.

COMPUTER PRODUCTS, INC., 2801 E. Oakland Park Blvd., Fort Lauderdale, Fla. 33309, a company engaged in the design, development, manufacture, and sale of electronic data processing equipment, filed to register 150,000 shares of common stock. Proceeds, at \$4 per share, will be used to finance the development, marketing, advertising, and sales of computer software, hardware, and consulting, and general corporate purposes. The underwriter is R.W. Smith, 1400 Alamo National Bldg., San Antonio, Texas 78204.

FACTSYSTEM, INC., 612 N. Michigan Ave., Chicago, Ill. 60611, a company engaged in the development and marketing of management information systems, filed to register \$1,000,000 of convertible subordinated debentures, due 1999. Proceeds, at \$10 per share, intended for retirement of short-term indebtedness, addition to the company's working capital, and general purposes including the lease of an IBM 360/20 computer. The underwriter is Alexander & Co., Inc., 11 Broadway, New York, N.Y.

BETA INSTRUMENT CORP., 377 Elliot St., Newton Upper Falls, Mass. 02454, a company engaged in the design, manufacture, and sale of CRT display equipment, including display system modules, precision CRT displays, computer graphic display devices, and computer output microfilm systems, filed to register 200,000 shares of common stock. Proceeds, at \$5 per share, will be used to finance the development, marketing, advertising, and sales of computer software, hardware, and consulting, and general corporate purposes. The underwriter is R.W. Smith, 1400 Alamo National Bldg., San Antonio, Texas 78204.

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## Earnings Reports

### BOOTH COMPUTER CORP.

3 Months Ended March 31  
 1969 1968  
 Revenue \$9,033,686 \$1,452,833  
 Earnings 711,700 176,937  
 Shr Earnings .33 .07

### COMPUTER CORP.

9 Months Ended Feb. 28  
 1969 1968  
 Revenue \$4,705,338 \$4,527,037  
 Earnings 276,795 223,843  
 Shr Earnings .30 .27

—Reinstated by the company to reflect the acquisition of Micro Dyne Instruments, Inc.

### GENERAL ELECTRIC CO.

3 Months Ended March 31  
 1969 1968  
 Rev. \$2,004,850,000 \$1,940,812,000  
 Earnings 77,516,000 70,842,000  
 Shr Earnings .56 .49

—Reinstated to reflect Federal income tax surcharge.

### WESTERN UNION TELEGRAPH

3 Months Ended March 30  
 1969 1968  
 Earnings \$6,800,000 \$4,300,000  
 Shr Earnings .70 .37

—Estimated by the company.

### ADVANCED COMPUTER TECHNIQUES CORP.

9 Months Ended Dec. 31  
 1969 1968  
 Revenue \$1,754,889 \$1,468,887  
 Earnings 76,257 70,689  
 Shr Earnings .12 .13

### RAYTHEON CO.

3 Months Ended March 31  
 1969 1968  
 Revenue \$293,097,000 \$283,626,000  
 Earnings 7,964,000 5,676,000  
 Shr Earnings .54 .43

—Reinstated to include operations of Gulf Design Corp. acquired in Nov. 1968 on a pooling-of-interests basis.  
 —Adjusted for 2-for-1 stock split in June 1968.

### ADVANCED COMPUTER TECH.

9 Months Ended Dec. 31  
 1969 1968  
 Revenue \$1,754,889 \$1,468,887  
 Earnings 76,257 70,689  
 Shr Earnings .12 .13

### COMPUTER EQUIPMENT CORP.

Year Ended Dec. 31  
 1969 1968  
 Revenue \$12,365,000 \$11,131,000  
 Earnings 698,000 896,000  
 Shr Earnings .31 .47

—Reinstated by the company to include acquisitions on a pooling-of-interests basis.

### COMPUTER INSTALLATIONS CORP.

Year Ended Dec. 31  
 1969 1968  
 Revenue \$1,183,794 \$647,250  
 Earnings 282,205 500,250  
 Shr Earnings .54 .20

### NATIONAL COMPUTER ANALYSTS, INC.

Year Ended Dec. 31  
 1969 1968  
 Revenue \$1,317,654 \$1,070,938  
 Earnings \$115,240 146,429  
 Shr Earnings .16 .21

—Includes non-recurring start-up costs of company's proprietary system, the NCA-1, developed in 1967 for 1-for-2 stock split in Dec. 1968.

### UNITED DATA CENTERS, INC.

Year Ended Dec. 31  
 1969 1968  
 Revenue \$2,182,388 \$1,967,000  
 Earnings 65,343 61,363  
 Shr Earnings .22 .20

—Report covers the first full year of operations.

### RCA

3 Months Ended March 31  
 1969 1968  
 Revenue \$769,900,000 \$758,200,000  
 Earnings 40,800,000 38,700,000  
 Shr Earnings .63 .60

## Orders and Installations

Marquardt Corp. of Ogden, Utah, has installed a Honeywell Model 120 computer system for general business applications.

Real Time Systems Limited of London, England, has ordered three Scan-Data Model 300 OCR systems for multifont, hand-print, multichannel loading; journal type transport; and on-line display and character insertion.

Wentworth General Hospital and Ohio Valley Hospital of Stearnsville, Ohio, have ordered National Cash Register Century 100 computer systems for inpatient accounting.

County Data Processing Center in Elmira, N.Y., has installed a Univac 9300 system to expedite a number of local government operations.

S.H. Benson Ltd. of Kingsway, London, England, has ordered an International Computers Limited 1901A computer to be employed in the production of TV time booking orders from information read directly from documents marked by advertising time buyers.

The Davis-Besse Nuclear Power Station of the Toledo Edison Co., Ottawa County, Ohio, has ordered a Bailey 880 nuclear instrumentation and reactor protection system, a 721 electronic analog control system, and an 855 process computer for control of both nuclear and steam systems.

Automotive Rentals Inc. of Pennsylvania, N.J., and Douglas Oil Co. of Los Angeles have ordered Honeywell Model 120 magnetic tape systems for general office purposes.

Forsvarets Fabriksverk, the National Defense Industries of Sweden, have installed an International Computers Limited 1902A computer for applications including stock control, payroll, accounting, production planning, and technical calculation.

Seventeen high schools in the Traverse Bay, Mich., area are planning to share a National Cash Register Century 100 to be located at Northwest Michigan College, Traverse City facility, for instruction in data processing.

Caisse Regionale Credit Agricole at Privas in southwestern France and Pretorium Trust of South Africa have installed International Computers Limited 1901A systems for general business and banking purposes.

Miller Brothers Co. of Chattanooga, Tenn., has ordered a National Cash Register Century 100 computer for recording of point-of-sale data on machine-readable "optical" tape.

John Dickinson & Co. Limited of England has ordered an International Computers Limited System 4-50 computer to develop on-line control of stocks held at Dickinson's stock exchanges and deposits throughout the U.K.

## Cyphernetics' Goal: National Service

ANN ARBOR, Mich. — Formation of a national computer service complex, which will be made available to business and industry through a time-sharing network, has been announced. Cyphernetics Corp., according to Charles W. Misler, president, will offer clientele an advanced time-sharing network, advanced software development, computer graphics, and computer management services.

Misler said Cyphernetics Corp. will be in full operation by June 1, with executive offices at 2290 First National Building.

Misler indicated the company will make available, through simplified languages for the non-specialist, large-scale computer power which is not subject to the many restrictions in present day, smaller time-sharing systems.

### On-Site Orientation

#### For New Subsidiary

NORTH BROOK, Ill. — Pryor Computer Industries has established a new subsidiary which will serve computer users of all sizes in the areas of systems analysis and programming, according to the company.

The new firm has been incorporated as the Pryor Computer

Software Corp., with offices at 209 S. LaSalle St., Chicago.

The firm operates as an autonomous unit of Pryor Computer Industries, and offers systems and programming services, working on-site if desired by clients.

### Firm to Specialize In 'Useful' Packages

NEW YORK — The establishment of Consolidated Software Inc., a new firm specializing in software packages, has been announced.

The company will engage in the marketing of generally useful software packages, according to William G. Debs, president. Consolidated Software was formed at the initiative of Programming Sciences, an established software firm based in New York, and will operate as a partly owned subsidiary of Programming Sciences.

The firm has acquired substantially all the assets of Software Resources Corp., and has also acquired from Programming Sciences Corp. a number of software packages developed by Programming Sciences or for which Programming Sciences has held marketing rights. Robert V. Head, who founded Software Resources, will serve as the executive vice-president of Consolidated Software.

Headquarters for the new company are at 235 E. 42nd St., New York; the Los Angeles office is at 1901 Avenue of the Stars.

## KEYDATA INSTITUTE

The Computer Education and Training Division of KEYDATA Corporation announces a

## GRAPHICS SYMPOSIUM "Interactive Graphics—Where is the Market?"

Tuesday, May 13 (The day before SJCC) 9:00-5:30 at John Hancock Hall in Boston

A Symposium designed to stimulate a fresh appraisal of the economic feasibility of interactive graphics, define the problem areas involved, and formulate future system requirements.

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### PANEL MEMBERS

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 Walter L. Johnson, Ford Motor Company  
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 Thurber J. Moffett, TRW Systems  
 Dr. Franz F. Selig, Mobil R&D Corporation  
 Dr. William R. Sutherland, MIT Lincoln Laboratory

#### Consultants:

Frank S. Grestewitz, Jr., KEYDATA Associates  
 John F. Merrell, The Computer Display Review  
 Norman H. Taylor, Arthur D. Little, Inc.

#### Manufacturers:

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The registration fee of \$40 entitles each attendee to a copy of the proceedings. If you cannot attend, you may purchase the proceedings for \$25.

Open registration begins at 8:00 a.m. For advance registration attach this ad and your check to your letterhead and send it to: Registrar, KEYDATA Institute, 108 Water Street, Woburn, Massachusetts 02172

# EDPeople on the move



	Is Now	At	Was	At
Jack C. Roy	District Manager	Computer Usage Co., Inc. Mt. Kisco, N.Y.	Marketing Analyst	IBM
William L. Witzel	President and Director	Pharos Systems Inc. Bethesda, Md.	Director of Marketing	General Precision Link Information Sciences Div.
Ted Y. Johnson	Senior Member Advisory Staff Software Systems Div.	CTC Computer Time- Sharing Corp. Palo Alto, Calif.	Manager of Data Processing Systems	California-Western States Life Insurance Co., Sacramento, Calif.
Edward J. Shaughnessy	Vice-President Marketing	Strategic Software, Inc.	Eastern Sales Mgr. Data Products Div.	Sanders Associates
Richard J. Courtney	Systems Analyst	Strategic Software, Inc.	Senior Systems Programmer	Omega Data Systems
Bruce C. Dale	Manager, Engineering Information Processing Systems Development	Raytheon Co. Lexington, Mass.	Senior Systems Consultant	Honeywell EDF Div.
Raymond F. Forthuber	District Manager	Computer Usage Co., Inc. Baltimore, Md.	Marketing Manager	IBM
Robert C. Stark	Vice-President Manufacturing	Ty-corr, Inc. Chelmsford, Mass.	Manager	Cambridge Waveguide Corp., Cambridge, Mass.
Laurence G. Brown	Vice-President Marketing	Progressive Data Management Corp. Cleveland, Ohio	Branch Manager	IBM Cleveland, Ohio
Paul Shook	Eastern Regional Manager, Brokerage Div.	Booth Computer Corp.	Marketing Manager	Xerox Corp. Los Angeles, Calif.
V. Reed Manning	Vice-President Technology	Rixon Electronics, Inc.	Senior Staff Member	Arthur D. Little Co. Cambridge, Mass.
Robert B. Boyle	Director of Operations	Logistic Distro-Data, Inc.	Management Information Systems	Aries Corp.
Raymond L. Kirk, Jr.	Associate Director of Instruction	Computer Sciences Institute, El Segundo, Calif.	President	Research Associates- Ltd., Hawaii
John R. McKee	Financial Vice-President	Systematic, Inc. Colorado Springs, Colo.	Controller	Union Starch and Refining Co.
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16 out. inch	\$92.00
17 out. inch	\$93.00
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Minimum run at these rates 12 weeks (negotiable).

## SDS to Construct Facility in Maryland

ROCKVILLE, Md. — Scientific Data Systems, the California-based computer manufacturer, has announced plans for the construction of a \$2.4-million computer facility in Rockville to house SDS's Washington-based marketing, systems engineering, and customer service operations. When completed in December 1989, the 78,000-sq-ft facility will initially accommodate 200 SDS personnel involved in the analysis, design, implementation, sale, and support of computer systems for use in commercial, industrial, and defense activities.

The new facility will permit SDS to service Eastern customers more efficiently by providing a centrally located Eastern base for systems support and implementation, the company says.

Standard SDS computers shipped from the company's California plant are modified in Rockville for such applications as monitoring hospital patients in intensive care wards, processing telemetry data from aircraft and space satellite systems, controlling private and public data communication networks, signal processing, and event simulation activities.

The new facility will replace three leased plants presently being used in the Rockville area and will triple current working floor space. The new building, according to the company, will accommodate an annual equipment shipment rate of approximately \$20 million and the building's design will permit easy expansion to support \$50 million in annual shipments.

### Third Center Opened

UNION TOWNSHIP, N.J. — Strategic Systems will open its third electronic data center facility in April. The center will be managed by Tom Stages, formerly with Metro Data Services.

### On-Line Opens Two Offices

NEW YORK — On-Line Systems, a computer time-sharing services firm providing remote computer services to its customers by phone lines, and services to industrial and educational institutions, has opened a New York branch office.

## PROGRAMMING SUPERVISOR

We are seeking an outstanding individual to join our young and aggressive management team. Our company, located in the Mid West, is in consumer product & contract manufacturing and marketing.

The successful candidate will have thorough knowledge in programming for the IBM-360 with a working knowledge of computer systems and at least 2 years as a senior programmer.

Our programming supervisor is responsible for the management of all programming, establishing and maintaining all computing standards.

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headed by John T. Coxhead. An office has also been opened in Buffalo with John R. Barrick as manager.



### Cullinane Opens Office

ALEXANDRIA, Va. — Cullinane Corp. has announced the opening of a technical and marketing office at 720 N. Saint Asaph St. to be headed by new Vice-President Arthur J. Ungerleider.

## PROGRAMMING SOUTHERN CALIFORNIA SENIOR PROGRAMMERS

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This growth, and our diversification in other areas, necessitates expanding our Management Information Systems Staff. We have current openings for Senior Programmer Analyst, Programmer Analyst, and Senior Programmer. The individuals who fill these positions will initially be involved with the design and implementation of a nationwide inventory control system and a contract and royalty system. Our equipment includes 360-40 under DOS using a 2314 and tape files.

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Our data processing department will continue to grow rapidly for the same reason it doubled in size last year.

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We require an individual with a college degree and sufficient third generation experience to manage programming, systems, and operations personnel.

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Reply in confidence to President Box 3054, COMPUTE WORLD

### Field Office Established

LOS ANGELES — Rixon Electronics has established its first field customer service office to provide efficient installations and service for Rixon equipment on the West Coast.

### Management Firm to Move

BURLINGTON, Mass. — Management Center of Cambridge, an international management training firm, will move to a new 32,000-sq-ft building in Vine Brook Park. In addition to housing its normal facilities, the new

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## Afips Records Called Inadequate 15% of Assets Are Not Verified

DETROIT - Major inadequacies in accounting records, doubt about the existence of some assets, and the lack of any formal set of books or of any audit by an independent certified public accountant were revealed in a report on the American Federation of Information Processing Societies by Jerome J. Ettinger, C.P.A. The report to the Afips Executive Committee and the Afips Board of Directors came to light last week.

Ettinger said that beginning balances for a newly established general ledger had to be developed simply from documents, work papers, etc., and from the financial statements rendered by Thomas J. Byron, Jr., of Concord, Mass., the organization's previous auditor.

Bruce Gilchrist, Afips executive director told CW that Afips officials were quite convinced that all the assets did in fact exist and that the auditor's comments had merely been typical of the type of comment involved when a new auditor took over a set of accounts. He said that the comments had been very helpful to Afips and that Afips intended to improve many of its procedures to match the wishes of the new auditor.

"We are a growing organization and this is typical of a growing organization's problems," he said.

Byron, contacted by *Computerworld*, said no one had asked his firm for any assistance or had queried any of its entries. "We have all our working papers and are quite ready to substantiate our entries," he said.

The new auditor said that 85% of the assets had been verified but left the fate of the other 15% - worth about \$100,000 - up in the air.

Asked about the fact that there was no general ledger, Byron said this was true but said he believed that the documents which had been kept by successive treasurers had been in adequate detail to permit proper audits. The work in his office had been handled by certified accountants, he said, and he pointed out that as a registered auditor with more than 20 years of experience, he was able to issue both certified and uncertified accounts. He also pointed out that Afips had successfully gone through two IRS audits "which were in some depth."

Ettinger reported that as well as Afips itself, the records of the 1967 fall and 1968 spring joint conference disbursements had been examined and, "in most cases," disbursements were supported by signatures of committee members authorized to approve them. No reference was made to the number of unap-

ported disbursements nor to the amount of money involved in such expenditures.

The report also revealed that Simulation Council had borrowed \$15,000 from Afips late in 1967 for a one-year period. Simulation Council cast one of the three votes needed to pass the new Afips constitution in January.

A special appropriation for member societies netted ACM a windfall of \$86,000 and Simulation Council just over \$16,000 just prior to the vote. This was in addition to the normal appropriations of approximately \$40,000 and \$8,000 respectively, which would have been made in any case. Simulation Council repaid its \$15,000 loan, and the ACM used the windfall to try, unsuccessfully, to survive the year's financial storms.

Afips, at the end of 1968 after allowing for the special distribution, apparently had a retained balance of \$150,000 as far as the books were concerned.

Previous audits had been provided regularly by Byron and, according to his reports, were based on "the books, records, correspondence, and treasury memorandum." This was stated to have been in accordance with generally accepted auditing standards and to have included the tests of accounting records that Byron considered necessary.

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